

## **REMARKS**

### **I. Introduction**

Claims 1 to 20 are pending in the present application. In view of the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

### **II. Rejection of Claims 1 to 3 Under 35 U.S.C. § 103(a)**

Claims 1 to 3 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of U.S. Patent Application Publication No. 2001/0005137 ("Horie '137"), U.S. Patent Application Publication No. 2002/0113596 ("Horie '596"), and U.S. Patent No. 5,250,168 ("Tsukada et al."). It is respectfully submitted that the combination of Horie '137, Horie '596, and Tsukada et al. does not render unpatentable these claims for at least the following reasons.

Claim 1 recites, *inter alia*, an evaluation circuit disposed on the substrate and in communication with the electrodes, the evaluation circuit configured to detect a degradation process of a motor oil based on the potentiometric response of the two electrodes.

The Examiner contends at pages 2 to 3 of the Final Office Action that the proposed combination of Horie '137, Horie '596, and Tsukada et al. would lead to a sensor device having all of the features of claim 1. In particular, the Examiner asserts that

[b]ecause Horie '596 already recognized that the circuitry 381 for the oil sensor can be located adjacent to the actual oil sensor (fig. 34 and par. 0174), it would have been obvious . . . to also utilize the substrate of Horie '137 that the electrodes were mounted to as a location for the evaluation circuit, as suggested by Tsukada, in order to facilitate the device integration and to minimize the number of substrates needed for the sensor."

Final Office Action at page 3. Applicants respectfully disagree for at least the following reasons.

Referring to Tsukada et al., the Examiner asserts that "Tsukada teaches in an alternate ion sensor that the sensor circuitry 17 (i.e., evaluation circuit) can be disposed on the same substrate as the electrodes for the sensor probe."

Final Office Action at page 3. Referring to the sensor circuitry 17, Tsukada et al.

makes clear that this circuitry 17 forms a voltage follower. Col. 4, lines 64 to 68. Referring to the configuration of Figure 8, relied upon by the Examiner in support of the present rejection, Tsukada et al. discloses that one circuit 17 is provided for each of two ion selective membranes 29 and 30, and reference electrode 31 is connected to the ground terminal 15, which serves as a ground terminal of the buffer amplifier of each sensor circuit 17. Col. 8, lines 51-62. The amplified “output signal, i.e., sensor detection signal from each of the sensor circuits 17 is transmitted to an external measurement circuit through lead wires connected to respective output terminals 37, 38 to thereby calculate the concentrations of Na ions and K ions in a solution to be measured.” Col. 9, lines 4 to 9 (emphasis added). Thus, although circuitry 17 may amplify and/or buffer a voltage received from membranes 29 and 30, any measurement or evaluation would occur at an external measurement circuit.

As such, even assuming, *arguendo*, that the rationale in support of the proposed combination of Horie '137, Horie '596, and Tsukada et al. is proper—which Applicants do not concede—the proposed resulting device would, at most, result in an oil sensor having electrodes disposed on a substrate with a signal *processing* circuit to amplify and/or buffer an output signal to be measured or evaluated by an *external measurement circuit* to determine any properties or characteristics of the oil. In plain contrast, claim 1 recites an evaluation circuit disposed on the substrate and in communication with the electrodes, the evaluation circuit configured to detect a degradation process of a motor oil based on the potentiometric response of the two electrodes. It is plainly apparent that the proposed combination of Horie '137, Horie '596, and Tsukada et al. does not disclose, or even suggest, this feature.

As indicated above, the combination of Horie '137, Horie '596, and Tsukada et al. does not disclose, or even suggest, all of the features of claim 1. Thus, the combination of Horie '137, Horie '596, and Tsukada et al. does not render unpatentable claim 1 or either of claims 2 and 3, which depend from claim 1. Accordingly, withdrawal of this rejection is respectfully requested.

### **III. Rejection of Claims 4 to 6 Under 35 U.S.C. § 103(a)**

Claims 4 to 6 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Horie '137, Horie '596, Tsukada et al., and U.S. Patent No. 5,904,987 (“Tani et al.”). It is respectfully submitted that the combination of Horie

'137, Horie '596, Tsukada et al., and Tani et al. does not render unpatentable these claims for at least the following reasons.

Claims 4 to 6 ultimately depend from claim 1 and therefore include all of the features recited in claim 1. As more fully set forth above, the combination of Horie '137, Horie '596, and Tsukada et al. does not disclose, or even suggest, all of the features recited in claim 1. Tani et al. is not relied upon for disclosing the features of claim 1 not disclosed or suggested by the combination of Horie '137, Horie '596, and Tsukada et al. Indeed, Tani et al. does not disclose, or even suggest, the features of claim 1 not disclosed or suggested by the combination of Horie '137, Horie '596, and Tsukada et al. That is, Tani et al. also does not disclose, or even suggest, an evaluation circuit disposed on the same substrate as two electrodes that form an interdigital comb structure.

In view of all of the foregoing, it is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., and Tani et al. does not disclose, or even suggest, all of the features of the any of claims 4 to 6. As such, it is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., and Tani et al. does not render unpatentable any of claims 4 to 6. Accordingly, withdrawal of the present rejection is respectfully requested.

#### **IV. Rejection of Claims 7 and 8 Under 35 U.S.C. § 103(a)**

Claims 7 and 8 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Horie '137, Horie '596, Tsukada et al., Tani et al., U.S. Patent No. 5,320,735 ("Kato et al.") and U.S. Patent No. 5,126,034 ("Carter et al."). It is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., Tani et al., and Carter et al. does not render unpatentable these claims for at least the following reasons.

Claims 7 and 8 ultimately depend from claim 1 and therefore include all of the features recited in claim 1. As more fully set forth above, the combination of Horie '137, Horie '596, Tsukada et al., and Tani et al. does not disclose, or even suggest, all of the features recited in claim 1. Kato et al. and Carter et al. are not relied upon for disclosing the features of claim 1 not disclosed or suggested by the combination of Horie '137, Horie '596, Tsukada et al., and Tani et al. Indeed, Kato et al. and Carter et al. do not disclose, or even suggest, the features of claim 1 not

disclosed or suggested by the combination of Horie '137, Horie '596, Tsukada et al., and Tani et al.

In view of all of the foregoing, it is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., Tani et al., Kato et al., and Carter et al. does not disclose, or even suggest, all of the features of either of claims 7 and 8. As such, it is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., Tani et al., Kato et al., and Carter et al. does not render unpatentable either of claims 7 and 8. Accordingly, withdrawal of the present rejection is respectfully requested.

**V. Rejection of Claims 9 to 13 Under 35 U.S.C. § 103(a)**

Claims 9 to 13 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Horie '137, Horie '596, Tsukada et al., and U.S. Patent No. 3,843,400 ("Radford et al."). It is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., and Radford et al. does not render unpatentable the present claims for at least the following reasons.

Claims 9 to 13 ultimately depend from claim 1 and therefore include all of the features recited in claim 1. As more fully set forth above, the combination of Horie '137, Horie '596, and Tsukada et al. does not disclose, or even suggest, all of the features recited in claim 1. Radford et al. is not relied upon for disclosing the features of claim 1 not disclosed or suggested by the combination of Horie '137, Horie '596, and Tsukada et al. Indeed, Radford et al. does not disclose, or even suggest, the features of claim 1 not disclosed or suggested by the combination of Horie '137, Horie '596, and Tsukada et al..

In view of all of the foregoing, it is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., and Radford et al. does not disclose, or even suggest, all of the features of any of claims 9 to 13. As such, it is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., and Radford et al. does not render unpatentable any of claims 9 to 13. Accordingly, withdrawal of the present rejection is respectfully requested.

**VI. Rejection of Claims 14 to 19 Under 35 U.S.C. § 103(a)**

Claims 14 to 19 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Horie '137, Horie '596, Tsukada et al., Tani et

al., U.S. Patent No. 4,582,589 (“Ushizawa et al.”), and U.S. Patent No. 5,522,980 (“Hobbs et al.”). It is respectfully submitted that the combination of Horie ‘137, Horie ‘596, Tsukada et al., Ushizawa et al., and Hobbs et al. does not render unpatentable these claims for at least the following reasons.

Claims 14 to 19 ultimately depend from claim 1 and therefore include all of the features of claim 1. As indicated above, the combination of Horie ‘137, Horie ‘596, Tsukada et al., and Tani et al. does not disclose, or even suggest, all of the features of claim 1. Ushizawa et al. and Hobbs et al. are not relied upon for disclosing the features of claim 1 not disclosed by the combination of Horie ‘137, Horie ‘596, Tsukada et al., and Tani et al. Indeed Ushizawa et al. and Hobbs et al. do not disclose, or even suggest, the features of claim 1 not disclosed or suggested by the combination of Horie ‘137, Horie ‘596, Tsukada et al., and Tani et al.

In view of the foregoing, it is respectfully submitted that the combination of Horie ‘137, Horie ‘596, Tsukada et al., Tani et al., Ushizawa et al., and Hobbs et al. does not disclose, or even suggest, all of the features of any of claims 14 to 19. As such, it is respectfully submitted that the combination of Horie ‘137, Horie ‘596, Tsukada et al., Tani et al., Ushizawa et al., and Hobbs et al. does not render unpatentable any of claims 14 to 19. Accordingly, withdrawal of this rejection is respectfully requested.

## **VII. Rejection of Claim 20 Under 35 U.S.C. § 103(a)**

Claim 20 was rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Horie ‘137, Horie ‘596, Tsukada et al., and U.S. Patent 1,956,741 (“Hornberger”). It is respectfully submitted that the combination of Horie ‘137, Horie ‘596, Tsukada et al., and Hornberger does not render unpatentable claim 20 for at least the following reasons.

Claim 20 depends from claim 1 and therefore includes all of the features recited in claim 1. As more fully set forth above, the combination of Horie ‘137, Horie ‘596, and Tsukada et al. does not disclose, or even suggest, all of the features recited in claim 1. Hornberger is not relied upon for disclosing or suggesting the features of claim 1 not disclosed or suggested by the combination of Horie ‘137, Horie ‘596, and Tsukada et al. Indeed, Hornberger does not disclose, or even suggest, the features of claim 20 not disclosed or suggested by the combination of Horie ‘137, Horie ‘596, and Tsukada et al.

In view of the foregoing, it is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., and Hornberger does not disclose, or even suggest, all of the features of claim 20. As such, it is respectfully submitted that the combination of Horie '137, Horie '596, Tsukada et al., and Hornberger does not render unpatentable claim 20. Accordingly, withdrawal of this rejection is respectfully requested.

**VIII. Conclusion**

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

Dated: February 1, 2010

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